

Comparison of Total Column Ozone Retrievals from a UV Spectroradiometer with those from a Dobson Spectrophotometer at Two Locations

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The Earth Systems Research Laboratory's Global Monitoring Division operates UV Spectrophotometers at Mauna Loa, Hawaii (MLO; 19.533°N, 155.578°W, 3.4 km), and Boulder, Colorado (BDR 39.99°N, 105.261°W, 1.62 km). The MLO UV spectroradiometer (UV3) installed in July of 1995 is operated as part of the Network for the Detection of Stratospheric Change (NDSC). To provide an additional site for these studies a UV spectroradiometer (UV5) was installed at BDR in June 1998. Both of these sites also have long term records of total column ozone measurements from Dobson Ozone Spectrophotometers made under all-sky conditions. The Dobson ozone values were used as the reference in an examination of the UV retrieved ozone data set. Each of these locations also makes high quality Aerosol Optical Depth (AOD) measurements that were used to determine the periods when comparable observations were made during clear sky conditions. Using ozone values derived from the UV data during a two year period (January 2004 till December 2005) shows that for clear sky conditions and Solar Zenith Angles less than 65 degrees, the retrieved ozone values from the UV spectroradiometer lie within the uncertainty (~2%) of the retrieved Dobson ozone values. The accuracy of the UV retrieved ozone values decreases with corresponding increases in the AOD during non-clear sky conditions.



Figure 1. UV5 UV Spectroradiometer built by NIWA, Lauder, New Zealand and operated in Boulder.